U.S. DEPARTMENT OF AGRICULTURE

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FIELD PACKING and VACUUM COOLING of LETTUCE

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The development and refinement of field packing has largely eliminated a major cost factor--the packing house--in the preparation of lettuce for market in important producing districts in the West. Formerly, the lettuce was hauled by truck to the packing houses, where heads were trimmed by hand and packed in crates. Field-packed lettuce is not trimmed. The freshly packed cartons are whisked from field by truck to vacuum cooler, then sped to markets throughout the United States. These pictures, taken for USDA's Agricultural Marketing Service, show scenes in the Salinas Valley, California.

N-27269--On trucks, in the field, workers quickly fabricate "knocked-down" lettuce cartons. These fiberboard cartons are telescoped in stacks of six, and carried into the fields by other workers. Other trucks are used to haul the lettuce to the vacuum coolers.

N-27261--Laborers become adept at carrying empty cartons on their heads when distributing containers in the field.

N-27262--While the cartons are being assembled and distributed, other workers are cutting the heads of lettuce. The heads are laid in groups of three, to make a ready "grab" for the packer.

N-27267--Packers use specially constructed, small, flat bed wheelbarrows which hold the cartons snugly during the packing operation.

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N-27263--Freshly-cut lettuce is placed in the cartons three heads at a time. The carton in this illustration holds two dozen heads.

N-27264--After packing, the lettuce is sprayed with water. This is to prevent wilting before the lettuce reaches the cooler.

N-27265--Metal clamping devices hold the carton rigid while lid flaps are stapled down.

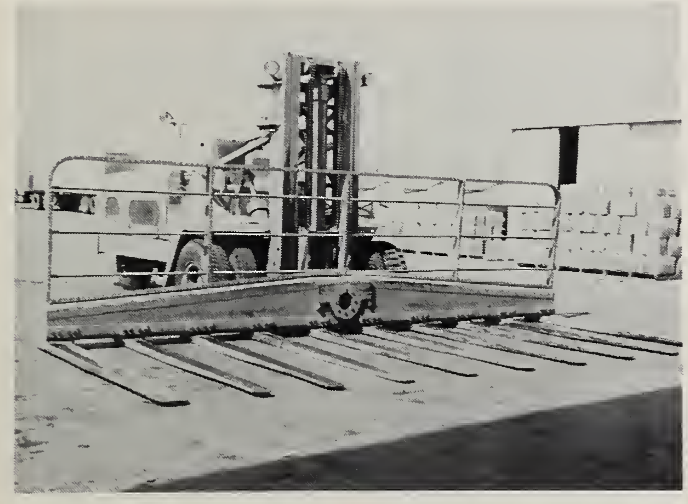
N-27266--Packing is finished for this carton, which will be picked up in the field for trucking to a cooler.

N-27260--This is an overall view of the packing crew at work.

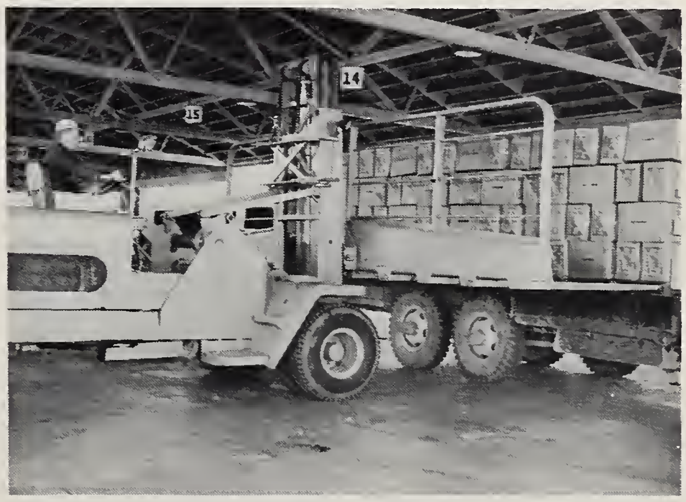
N-27268--Here trucks are being used in two separate operations. On the near truck, cartons are being fabricated. On the other, packed lettuce is being loaded.

Vacuum Cooling in California

Packed cartons of lettuce, still warm from the field, are sent to vacuum cooling plants. Here the cartons are sealed in large metal chambers equipped to reduce air pressure. This reduction causes rapid evaporation of moisture from the lettuce, creating a sharp drop in temperature. It takes approximately 20 minutes to cool a half-carload, or 320 cartons, to the optimum temperature of $33\frac{1}{2}$ degrees F. At this point, the lettuce is removed from the chamber and immediately conveyed to waiting refrigerated trucks or railroad cars. By using mechanized equipment, hand labor is reduced to a minimum. The following pictures were taken at Salinas, California.



N-27288--Prime handler and mover of cartoned lettuce is this large fork-lift. The fork will lift two rows of pallets. Lettuce waiting for cooling and a vacuum chamber are in the background.



N-27285--On an unloading dock, a fork-lift prepares to unload truck of field-packed lettuce. Similar facilities and equipment are generally found at most vacuum-cooling plants in California.

N-27289--In one prodigious "bite", fork-lift removes 320 cartons or a half-carload of lettuce from truck. These cartons hold two dozen heads of lettuce. Others hold 18 to 30 heads.

N-27286--In preparation for cooling, cartoned lettuce is redistributed into single-pallet rows on a long, narrow dolly. This operation is done by a smaller fork-lift.

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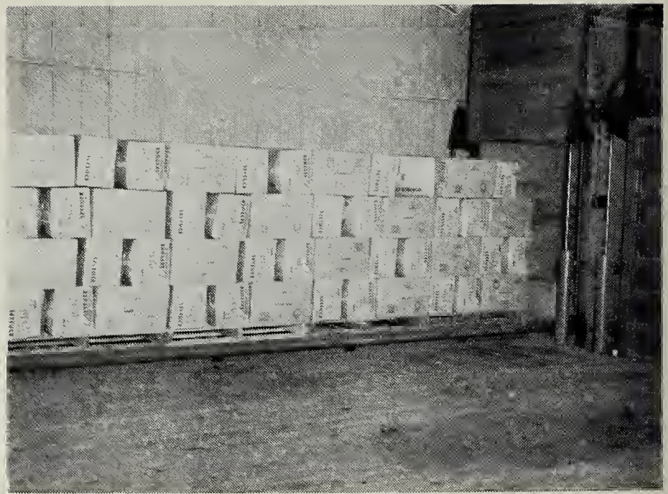
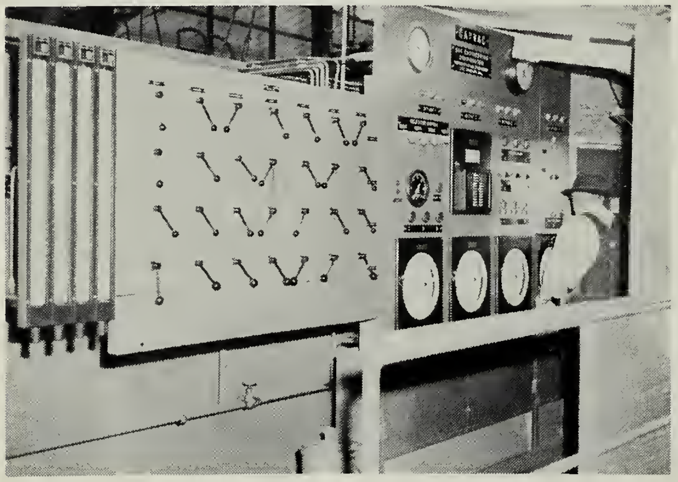
N-27290--The cartons are maneuvered into the vacuum tube for cooling. In approximately 20 minutes the optimum temperature of $33\frac{1}{2}$ degrees F. will be reached.



N-27291--The lettuce is removed from the cooling area. Stacking to permit free circulation of air was done on truck in the field; a must for proper vacuum cooling.



N-27295--An operator checks the instrument panel and control board in a Salinas, California vacuum-cooling plant. This plant has three "vacuum tubes."

N-27292--Immediately after leaving the cooling chamber, the cartons are conveyed to waiting refrigerated trucks or rail cars. Loading is the only phase of the cooling process where human handling of individual cartons is necessary.

N-27293--Here, the lettuce moves from cooler to a refrigerated truck. Simple shunting will divert line to railroad cars alongside.

N-27294--The line of cartons is diverted and moves on conveyor to refrigerator cars alongside the plant at Salinas, California.